

TITLE OF THE INVENTION  
INFORMATION PRESENTATION SYSTEM, INFORMATION  
PRESENTATION APPARATUS, CONTROL METHOD THEREOF AND  
COMPUTER READABLE MEMORY

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FIELD OF THE INVENTION

The present invention relates to a an information  
presentation system and information presentation  
apparatus configured in such a manner that an  
10 information distribution terminal is connected via a  
network to an information presentation terminal  
presenting information distributed from the information  
distribution terminal, a control method therefor and a  
computer readable memory.

15

BACKGROUND OF THE INVENTION

Various methods for informing flow information  
such as ever-changing fresh news articles to users have  
been proposed. Among them, for example, news programs  
20 on television and radio are one of the oldest and  
prevalent information presenting methods.

In these news programs, a news caster reads out a  
manuscript to convey information to users. Information  
is conveyed by voice, thus making it possible for a  
25 user to hear information while carrying out cleaning or  
driving a car, for example, and the need for  
monopolizing attention from the user all the time thus

is eliminated. Also, in television, visuals are used to provide information more effectively.

On the other hand, communication technologies such as computers and Internet have been developed, and new  
5 information presenting methods such as home pages describing the latest news and services for distributing news through e-mails have been proposed. These information presenting methods have features missing in television and radio in the sense that they  
10 have on-demand natures allowing information to be provided whenever it is needed, and interactive natures enabling a user to indicate desired information by news genre and the like, not just receiving information one-sidedly. Also, since static images and moving images  
15 can be treated, it is possible to provide information more effectively by appealing to visual.

However, news programs on television and radio lack on-demand natures allowing information to be provided whenever it is needed, and interactive natures  
20 allowing an audience to indicate desired information in accordance with a news genre and the like, because their broadcast time is fixed and the order of the contents of news to be conveyed is fixed by a broadcasting station.

25 On the other hand, supply of news by homepages describing news articles, services of news articles through e-mails, and so on leads to a high barrier for

people who cannot operate personal computers well.  
Also, since information is supplied only by texts, a  
user should "read" the information by paying attention  
to the screen all the time for receiving the  
5 information, leading to lack of convenience of  
receiving information while for example carrying out  
cleaning or driving a car at the same time.

#### SUMMARY OF THE INVENTION

10 An object of the present invention is to provide  
an information presentation system and information  
presentation apparatus capable of providing more  
effective presentation of information, a control method  
thereof and a computer readable memory.

15 According to the present invention, the foregoing  
object is attained by providing an information  
presentation system comprising a sending apparatus  
sending send data including text information, and a  
receiving apparatus is connected to the sending  
20 apparatus in being capable of communication and  
receives the send data, wherein the receiving apparatus  
comprises: voice outputting means for carrying out  
voice synthesis based on text information included in  
received send data, and outputting obtained synthetic  
25 voice; first displaying means for displaying speaker  
images imitating speakers of the synthetic voice; and

second displaying means for displaying a text string to be spoken by the synthetic voice in a text display form corresponding to each of the speaker images.

5 Other features and advantages of the present invention will be apparent from the following description taken in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the figures  
10 thereof.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute a part of the specification,  
15 illustrate embodiments of the invention and, together with the description, serve to explain the principles of the invention.

FIG. 1 is a block diagram showing a hardware configuration of each computer constituting an  
20 information presentation system of each embodiment of the present invention;

FIG. 2 is a block diagram showing a schematic configuration of the information presentation system of First Embodiment of the present invention;

25 FIG. 3 is a block diagram showing a functional configuration of an information distribution computer of First Embodiment of the present invention;

FIG. 4 is a block diagram showing a functional configuration of an information presentation computer of First Embodiment of the present invention;

FIG. 5 shows an example of a structure of data stored in an external storage device of the information presentation apparatus of First Embodiment of the present invention;

FIG. 6 is a flowchart showing a procedure for processing carried out in the information presentation system of First Embodiment of the present invention;

FIG. 7 shows news articles arranged by genre in First Embodiment of the present invention;

FIG. 8 illustrates classification of news articles by genre in First Embodiment of the present invention;

FIG. 9 shows an example of files for defining virtual casters of First Embodiment of the present invention;

FIG. 10 shows an example of files for defining each news genre of First Embodiment of the present invention;

FIG. 11 shows an example of generating an operation description language in First Embodiment of the present invention;

FIG. 12 shows an example of displaying screens in First Embodiment of the present invention;

FIG. 13 shows another example of displaying screens in First Embodiment of the present invention;

FIG. 14 shows another example of generating an operation description language in First Embodiment of the present invention;

FIG. 15 is a block diagram showing a functional configuration of the information presentation system of Second Embodiment of the present invention;

FIG. 16 is a flowchart showing a procedure for processing carried out in the information presentation system of Second Embodiment of the present invention;

FIG. 17 shows an example of a structure of data that is managed when letter information and image information are emphasized in Second Embodiment of the present invention;

FIG. 18 shows an example of displaying screens in Second Embodiment of the present invention;

FIG. 19 shows another example of displaying screens in Second Embodiment of the present invention;

FIG. 20 shows a functional configuration of the information presentation apparatus of Third Embodiment of the present invention;

FIG. 21 is a flowchart showing a procedure for processing carried out in the information presentation apparatus of Third Embodiment of the present invention; and

FIG. 22 shows one example of presentation of information including conversations between a character

A and a character B in Third Embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

5       Embodiments of the present invention will be described in detail below, referring to the drawings.

FIG. 1 is a block diagram showing a hardware configuration of each computer constituting an information presentation system of each embodiment of  
10       the present invention.

In FIG. 1, a CPU 101 controls an entire information processing apparatus 1000 via a main bus 116, and controls, via an input I/F (interface) 104, an input device 110 (for example, a microphone, an image  
15       scanner, a storage device, other information processing apparatuses connected via network lines, and a facsimile apparatus connected via a telephone line) connected to the outside of the information processing apparatus 1000. It also controls, via an output I/F  
20       105, an output device 111 (for example, a speaker, a printer, a monitor, other information processing apparatuses connected via network lines, and a facsimile apparatus connected via a telephone line) connected to the outside of the information processing  
25       apparatus 1000. Also, the CPU 101 carries out a series of processing such as input of images, image processing, processing of color transformation and output control

for images in accordance with instructions inputted from an input unit (for example a keyboard 112, a pointing device 113 and a pen 114) via a KBD I/F (keyboard interface) 107. In addition, it controls via  
5 a video I/F (interface) 108 a display unit 109 displaying image data inputted from the input device 110 and image data created using the keyboard 112, pointing device 113 and pen 114.

A ROM 102 stores therein a various kinds of  
10 control programs for executing various kinds of controls of CPU 101. Those various kinds of programs, and various kinds of data required for performing each embodiment may be stored in an external storage device 106 constituted by a hard disk, a CD-ROM, a DVD-ROM and  
15 the like. In a RAM 103, the OS and other control programs including control programs for achieving the present invention are loaded and executed by the CPU 101. It also functions as various kinds of work areas that are used for executing control programs, and  
20 temporary save areas. Also, a VRAM (not shown) stores temporary image data inputted from the input device 110 and image data created using the keyboard 112, pointing device 113 and pen 114 is configured.

<First Embodiment>

25 In First Embodiment described below, a configuration will be described in which using character animation and voice synthesis, a virtual



caster conveys the contents of news articles to users by voice in imitation of a human caster of a television program, and it is made possible to display letter strings corresponding to the article contents, thus  
5 conveying the contents to users by both voice and letter strings. Here, for example, news articles distributed via a network such as Internet from a provider of the news articles are received, are arranged by genre, and are conveyed to users in  
10 predetermined genre order. In addition, according to First Embodiment, a desired genre can be designated at any time through voice input by the user, thus making it possible provide information on demand and interactively.

15 FIG. 2 shows a block diagram showing a schematic configuration of the information presentation system of First Embodiment of the present invention.

In FIG. 2, an information distribution computer 2101 distributes information such as online news  
20 provided by information providers (for example, news articles provided by news information providers), via a network 2103. An information presentation computer 2102 divides distributed information such as the contents of online news distributed via the network  
25 into a synthetic voice portion for reading out the information with synthetic voice of a character (animation image) and display portion for displaying

the information with letter information such as titles of news and image information such as pictures to present the distributed information to users.

The network 2103 is used for data communication  
5 between the information distribution computer 2101 and the information presentation computer 2102. Examples of this network include a wireless network, Internet and a public line.

FIG. 3 is a block diagram showing a functional  
10 configuration of the information distribution computer of First Embodiment of the present invention.

The information distribution computer 2101 has an information retaining unit 201 for retaining news information representing news articles to be provided  
15 to the user, an information updating unit 202 for updating to the latest the information retained in the information retaining unit 201, and a communication unit 203 for sending the news information retained in the information retaining unit 201 to the information  
20 presentation computer 2102 via the network 2103.

The news information provider inputs news information to be provided in this information distribution computer 2101, whereby the inputted news information is retained in the information retaining  
25 unit 201, and is then distributed to the information presentation computer 2102. The information presentation computer 2102 can receive this news

information all the time by making access to the  
information distribution computer 2101.

FIG. 4 is a block diagram showing a functional  
configuration of the information presentation computer  
5 of First Embodiment of the present invention.

An information arrangement unit 301 makes  
arrangements such as retaining news information  
received from the information distribution computer  
2101 by genre. An operation description language  
10 transforming unit 302 transforms news information into  
an operation description language. An operation  
description language executing unit 303 operates a  
virtual caster in the form of a character (animation  
image), makes the caster read news information through  
15 voice synthesis, and displays captions and the like on  
a screen, in accordance with the operation description  
language created by the operation description language  
transforming unit 302.

An information providing process controlling unit  
20 304 manages a whole process from the start to the end  
of providing information to the user. In addition, if  
voice input by the user occurs during execution of the  
operation description language, the information  
providing process controlling unit 304 suspends the  
25 execution of the operation description language  
executing unit 303 to make voice recognition of the  
input. In this way, the information providing process

controlling unit 304 manages the news genre to be conveyed, e.g. switching the news genre to a designated news genre in the case where the user designates a news genre by voice. A communication unit 305 achieves  
5 communication between the information distribution computer 2101 and the information arrangement unit 301.

Furthermore, in First Embodiment, a virtual caster definition file 601, a genre definition file 701, a character file group 1210 and a control program 1220  
10 are included in the external storage device 106 of the information presentation computer 2102, as shown in FIG. 5.

The virtual caster definition file 601 is composed of data for defining the correspondence of the virtual  
15 caster with animation data and waveform data for voice synthesis (details thereof will be described later referring to FIG. 9). The genre definition file 701 is composed of data for defining the correspondence of the genre with the virtual caster (details thereof will be  
20 described later referring to FIG. 10). The character file group 1210 includes a plurality of character files (1211). Each character file 1211 includes animation data 1213 for providing animation display of the character and a waveform dictionary 1212 for performing  
25 voice synthesis. The control program 1220 is a group of program codes for having achieved by the CPU 101 the control procedure shown by the flowchart in FIG. 6.

FIG. 6 is a flowchart showing a procedure for processing carried out in the information presentation system of First Embodiment of the present invention.

First, the information arrangement unit 301 of the  
5 information presentation computer 2102 communicates with the information distribution computer 2101 via the communication unit 305 (network interface 1207) and the network 2103 to download news information, and arrange the information by genre as shown in FIG. 7 (step S401).

10 Furthermore, for arranging the downloaded news information in the form shown in FIG. 7, the correspondence of the news information with the genre may be designated manually, or data of the news information may be analyzed to establish their  
15 correspondence automatically. In the case where the information arrangement unit 301 establishes correspondence automatically, the following procedures may be followed, for example.

(1) As shown in FIG. 8, article data 1301 sent to  
20 the information presentation computer 2102 by the information distribution computer 2101 has headlines 1302, article contents 1303 and attributes 1304. The information presentation computer 2102 makes a classification by genre (1310) based on each attribute  
25 1304 of the received article data 1301, and in accordance therewith, the headlines and article contents (bodies) are classified as shown in FIG. 7.

(2) Alternatively, a keyword search is made for at least any one of the headlines 1302 or the article contents 1303 included in the article data 1301, the genre of the article is determined (1311), and the headlines and article contents (bodies) are classified as shown in FIG. 7.

Furthermore, in the case where the above method (2) is used, the attributes 1304 of the article data 1301 are not necessary. Also, the above method (1) may be used in combination with the above method (2) as a matter of course. In addition, in First Embodiment, the result of classifying news information by genre is retained as a genre classification table 501 as shown in FIG. 7, but the method of retaining the above described result of genre classification is not limited thereto.

Also, in subsequent processes, information is presented in the order of genre numbers shown in FIG. 7, but needless to say, a configuration may be made so that the user sets this number as desired.

In addition, at this time, the information providing process controlling unit 304 determines a structure for providing information. The structure for providing information refers to a settlement as to which virtual caster is made to speak about which genre, and how the letter strings expressing the spoken contents are displayed. As information for determining

the structure for providing information, virtual casters, backgrounds and article genres are set as shown in FIGS. 9 and 10.

FIG. 9 shows one example of the contents of a virtual caster definition file of First Embodiment of the present invention.

The virtual caster definition file 601 establishes the correspondence of the names of virtual casters with the animation data 1212 that are used and the waveform dictionary 1213 for voice synthesis. The "tag< >" represents the definition of each virtual caster, and its name is defined by the "name". The "color" refers to the color of letters constituting letter strings when the spoken contents of the virtual caster are displayed on the screen. For this, a different color is assigned to each virtual caster. Also, the "file" specifies the character file 1211 defining the waveform dictionary 1212 that is used when the voice of the virtual caster is voice-synthesized, the animation data (image data) 1213 and the like. Furthermore, since the waveform dictionary 1212 and animation data 1213 can be achieved by using conventional techniques, and details thereof are not described here.

FIG. 10 shows one example of the contents of the genre definition file for defining each news genre of First Embodiment of the present invention.

In genre definition file 701, the correspondence of the news genre with the virtual caster is registered. The "tag < >" defines the news genre, and its name is defined by the "name". And, the "caster" specifies a  
5 virtual caster to convey the news of the genre.

Furthermore, the above virtual caster definition file 601 and the genre definition file 701 may be created by the news information provider and distributed at the time of distributing news  
10 information, or they may be retained previously in the information presentation computer 2102 to suite user preference. In First Embodiment, the data shown in FIGS. 9 and 10 are previously retained in the external storage device 106, in the information presentation  
15 computer 2102. Of course, the contents of each definition may be changed manually.

When initialization described above is completed, the operation description language transforming unit 302 generates an operation description language to  
20 provide news to the user through processes of steps S402 to S408. That is, the operation description language transforming unit 302 performs transformation to an operation description language as shown in FIG. 11 referring to the genre classification table 501  
25 shown in FIG. 7, the virtual caster definition file 601 shown in FIG. 9 and the genre definition file 701 shown in FIG. 10.



First, the genre number J of news to be conveyed to the user is initialized at 1, and the article number I is initialized at 1 (step S402). Then, at step S403, a command for displaying a virtual caster that reads out the article of genre J is described (801 in FIG. 11), and at step S404, the display of the headline, voice output, and the display of letter strings (captions) expressing the contents of voice output are described for the Ith article data of the genre J, as shown by 802 in FIG. 8. The headline and the contents of voice output correspond to the headline 1302 and the article contents 1303 in the article data 1301, and can easily be identified from data described with HTML and the like.

For example, J = 1 refers to the "political" genre, and virtual casters to convey news are "mainCaster, subCaster" according to the genre definition file 701 in the scene of this genre, and thus an operation for making these two casters appear in defined position (position1, position2) is described ("Caster->Show (mainCaster, position1)", "Caster->Show (subCaster, position2)").

Then, an operation of displaying in front the letter string of the headline of the I = 1st news article is described ("FrontText->Display (Opposition parties opposing Prime Minister's announcement of tax reduction policy)"). Here, a predetermined color is

assigned for the color of the letter string of the headline, and in this example, the headline is expressed in red color. Furthermore, for the letter color for the letter string of the headline, a color that is not assigned to any caster is preferably assigned. For this reason, the headline can easily be identified from letter strings that are read out.

Then, an operation of making the virtual caster reading out the article contents is described ("Caster->Speak (Prime Minister XXX ..."substantial tax reduction"..., mainCaster"), and an operation of displaying captions on the screen in designated color for each virtual caster is described ("SpokenText->Display (Prime Minister XXX ..."substantial tax reduction"..., white"). Here, the operation description language transforming unit 302 reads the display color shown by the "color" for the caster from the virtual caster definition file 601 in FIG. 9 on the basis of the "mainCaster", and describes the same.

Furthermore, in the case where a plurality of virtual casters is defined like the political genre, virtual casters reading out captions may be changed one after another for each sentence.

When all the operation description language for one article is executed completely, whether or not the article is the last article in the genre J is checked (step S405), and if it is not the last article, the

value of J is left unchanged and I is incremented (step S407), and the process returns to step S404, thereby performing transformation to the operation description language of the next news article in the same genre.

5 On the other hand, if it is determined at step S405 that the article is the last article in the genre J, whether or not the genre J is the last genre to be read out lastly is checked (step S406). If it is not the last genre, J is incremented by one, I is initialized  
10 at 1 (step S408), and the process returns to step S403 for processing the next genre.

If it is determined at step S406 that the genre is the last genre, the process proceeds to step S411, where the operation description executing unit 303  
15 performs display of character animations, display of characters and voice synthesis/output in accordance with the operation description language generated through the above described processes.

The corresponding character 1211 is obtained from  
20 the caster definition file 601 with the names of casters designated in operation description language at step S411, and animation characters are displayed based on the animation data 1213 included in the obtained character file 1211, at step S412. Then, at step S413,  
25 an example of text described with the above described SpokenText-> is displayed in a designated color. Then, at step S414, the waveform dictionary 1212 included in

the character file 1211 obtained at step S411 is used to voice-synthesize an example of text described with the above described Caster->Speak and voice-output the same.

5           At step S415, whether or not processing has been performed for all the data transformed into the operation description language is determined, and if there exists data to be processed, the process returns to step S411. Also, if processing is completed, this  
10   process is ended. Furthermore, in the above described procedure, transformation to the operation description language for all of the data arranged as shown in FIG. 7 before the execution of the operation description language is started, but execution of the operation  
15   description language may be started before transformation to the operation description language is completed.

FIG. 12 shows an example of a screen presented to the user when information is provided in First  
20   Embodiment of the present invention.

On a screen 901, virtual casters operate and captions of a news article are presented to the user. Virtual casters 902 and 903 read out the news article including a headline 904. Captions 905 and 906 display  
25   the contents spoken by the virtual casters 902 and 903, respectively.

In FIG. 12, for captions, letter colors different for each speaking virtual caster are defined by the "color" in FIG. 9. All the contents spoken by the virtual caster 902 are displayed in a color identical to that of the display 905 while all the contents spoken by the virtual caster 903 are displayed in a color identical to that of the display 906, and they are thus displayed in colors different for each virtual caster. Also, a display color is specified in advance for the headline of the article 904, which is displayed in a letter color different from those of the contents spoken by the virtual casters.

As described above, according to First Embodiment, since the distributed news article is read out through voice synthesis, it is not necessary to focus attention on the screen all the time to read displayed text, and thus information can be collected with ease.

Also, in addition to voice synthesis/output, the headline of the article is displayed with captions and the read-out contents are displayed with captions, thereby enabling the contents to be recognized correctly even if the system is used by a visually impaired person, and if the contents cannot be heard well due to loud noise occurring around. In addition, according to First Embodiment, a display is provided in such a manner that the letter colors of captions corresponding to the headline and each caster are

different from one another, thus making it possible to understand easily which caption corresponds to the headline and which caption corresponds to the contents read out by the virtual caster, of captions of the article displayed diversely in the screen, and which virtual caster displayed in the screen reads out the contents.

Furthermore, in the above described First Embodiment, the headline and the spoken contents are displayed with the letter color is defined for the headline and each virtual caster, but the invention should not be limited thereto. It is essential only that the user understand whether the displayed character corresponds to a headline or which virtual caster speaks the contents, and for making the user understand it, display forms different for the headline and each virtual caster may be used.

For example, FIG. 13 shows an example in which the spoken contents of respective virtual caster are displayed near the virtual casters to specify the contents of each caster. To achieve this such display, an operation description language as shown in FIG. 14 is generated in the operation description language transforming unit 302, and this language is executed by the operation description language executing unit 303.

As shown in FIG. 14, in the description expressing display of the spoken contents, the position of display

of the speaking virtual caster is additionally described. For example, it is expressed with a description such as "SpokenText->Display (Prime Minister XXX ..."substantial tax reduction"..., white, position1) that captions are displayed in a defined position relative to the "position2" that is a position in which the "mainCaster" is displayed (1101 of FIG. 14). Similarly, captions are displayed in a defined position relative to the "position2" that is a position in which the "subCaster" is displayed, in accordance with the description denoted by reference numeral 1102 in FIG. 14. Furthermore, for these relative positions of captions, predetermined values may be used, or values may be defined in the above operation descriptions. Also, in this case, the color of letters of the spoken contents of each virtual caster is not necessarily different for each virtual caster. With the above description 1101, a caption of the spoken contents 1002 is displayed near an animation of mainCaster 1001, and a caption of the spoken contents 1004 is displayed near an animation of subCaster 1003, as shown in FIG. 13.

Examples in which letter colors and display positions are used as display forms different for the headline and each virtual caster have been described above, but it can be considered there exist variations in addition thereto. For example, it is possible to

use different letter sizes or styles, different backgrounds for caption portions and different ruled lines for the headline and each virtual caster.

Also, in the above described First Embodiment, the  
5 definition of virtual casters, the definition of news genres and the operation description language are described as shown in FIG. 9, FIG. 10 and FIG. 11, respectively, but they are not limited thereto, and any description format may be used as long as it is  
10 satisfied for uses of the above described Example 1.

Also, in the above described First Embodiment, news articles have been described as an example of distributed data, but the information presentation method of this First Embodiment may be applied for  
15 other data such as various kinds of advertisements.

Also, in the above described First Embodiment, the case has been described in which each data communication is performed by using Internet, but it is not limited to Internet, and any communication means,  
20 for example a dedicated line may be used.

In the above described First Embodiment, the case has been described in which programs are retained in the external storage device 106 and are loaded into the RAM 103 to use the programs, but the storage medium is  
25 not limited thereto, and any storage medium such as the ROM may be used to achieve the embodiment. Also, a



circuit operating in a similar way may be used to achieve it.

<Second Embodiment>

In First Embodiment, for characters not restricted  
5 to a specific window, they can be made to appear in  
positions predefined by the system, or the user can  
freely move their positions. However, there may be  
cases where the position in which the character is  
displayed may accidentally overlap the position in  
10 which other information is displayed, and the character  
blocks the user's view.

When the character is placed in the position  
predefined by the system, if letter information and  
image information to be displayed by the system at the  
15 same time is displayed behind the character, the  
character is displayed on letter information and image  
information, and the information under the character is  
covered and hidden from the user's view. If letter  
information and image information are displayed in  
20 front of the character, the character is covered and  
hidden from the view.

When the user moves the character, the contents of  
letter information and image information displayed  
under the moved character may be changed, and even if  
25 the contents that the user wants to see are displayed  
under the character, they may be unnoticed by the user.

Also, displayed letter information and image information are automatically updated as in the case of Internet and online news, unfavorable words and images may be displayed accidentally.

5        Then, in Second Embodiment, the position in which the character is presented is controlled based on the letter information and image information displayed together with the character, thereby providing information more effectively.

10        FIG. 15 is a block diagram showing a functional configuration of the information presentation system of Second Embodiment.

         The information presentation system processes information distributed from the information  
15        distribution computer 2101 into a synthetic voice portion read out with synthetic voice in the information presentation computer 2102, and a portion displayed as images, and in particular, the synthetic voice portion is presented to the user in  
20        synchronization with the character (animation image). In Second Embodiment, the character is controlled through a server program, and the information presentation computer 2102 only requires the server program to control the character.

25        An information collecting unit 1501 collects distributed information distributed from the information distribution computer 2101. An information

editing unit 1502 divides the distributed information collected into a synthetic voice portion read out with the synthetic voice of the character and a display portion displayed as letter information and image information, and arranging the same in specified order. An information presentation unit 1503 presents edited distributed information in succession.

An importance reading unit 1504 reads the importance as to presented letter information and image information. A positional relation determining unit 1505 determines a positional relation between the letter information and image information and the character.

A character controlling unit 1506 makes a request to read out information to be read out through synthetic voice of the character, and makes a request for movement when the letter information and image information and the character overlap one another.

FIG. 16 is a flowchart showing a procedure for processing carried out by the information presentation system of Second Embodiment of the present invention.

At step S1601, distributed information distributed from the information distribution computer 2101 is collected. At step S1602, the distributed information collected is divided into a synthetic voice portion read out through the synthetic voice of the character and a display portion displayed as letter information

and image information, and is arranged in specified  
order. In Second Embodiment, the network 2103 is  
Internet and online news on Internet is collected, and  
is divided as a display portion with headlines, tables  
5 and the like in the online news displayed as letter  
information and photo images in the online news  
displayed as image information, and a synthetic voice  
portion with the whole text of the online news read out  
through the synthetic voice of the character. Actually,  
10 the information in the online news is divided into the  
display portion and synthetic voice portion based on a  
tag and the like described in HTML documents  
constituting the online news as described in First  
Embodiment. In addition, the online news is classified  
15 into financial news, political news, sports and weather  
reports in accordance with types of news, and is  
rearranged in specific order. Also, when the  
information is divided, the server program determines  
the importance of the information based on position  
20 information showing the position in which information  
such as types of news is displayed, adds the importance  
and their important points to the letter information  
and image information in the online news, and  
associates the letter information and image information  
25 with the importance and important points added thereto  
to manage them.

At step S1603, whether or not there exists presentation information is determined. If there exists no presentation information (NO in step S1603), the process ends. On the other hand, if there exists presentation information (YES in step S1603), the process proceeds to step S1604.

Furthermore, in the case of Second Embodiment, whether online news is presented on a one-by-one basis or the process is ended is determined for each type thereof at step S1603. The presentation information in this case also includes letter information and image information corresponding to a display portion, and a synthetic voice portion read out by the character. If no presentation information remains, the process ends.

At step S1604, whether or not there exists a description as to importance in the letter information and image information to be presented is determined. If there exists no description as to importance (NO in step S1604), the process proceeds to step S1608. On the other hand, if there exists a description as to importance (YES in step S1604), the process proceeds to step S1605.

At step S1605, a positional relation between the important point added to the letter information and image information to be presented and the character is calculated.

At step S1606, whether or not it is necessary to move the character, namely whether or not the letter information and image information and the character overlap one another is determined based on the  
5 calculated positional relation. If it is not necessary to move the character (NO in step S1606), the process proceeds to step S1608. On the other hand, if it is necessary to move the character (YES in step S1606), the process proceeds to step S1607.

10 At step S1607, a request is made to move the character from the current character display position to a character display position such that a distance of movement from the image display position is the minimum, in order to prevent a situation where the image display  
15 position in which the letter information and image information are displayed overlap the character display position in which the character is displayed.

At step S1608, information is presented. The presentation of information in this case refers to the  
20 displaying of the letter information and image information to be displayed and the reading out of the information through the synthetic voice of the character. When one presentation of information is completed, e.g. information to be read out is read out  
25 completely, the process returns to step S1603, where presentation of information is repeatedly performed as long as information to be presented remains.

Specific examples of the above described processing will be described using FIGS. 17 to 19.

FIG. 17 shows an example of a structure of data that is managed when importance is added to the letter  
5 information and image information in Second Embodiment of the present invention.

As described above, when importance is added to the letter information and image information in distributed information, their important points are  
10 associated therewith to be managed. The important point refers to the display position on the display screen of the information presentation computer 2102, and for example, the important point is defined as "center" if the position corresponds to the center of  
15 the display screen and the important point is defined as "whole" if the position corresponds to the whole of the display screen.

The example of FIG. 17 is an example of the case where "weather reports" and "airline seat  
20 availabilities" are collected as distributed information from the information distribution computer 2101. This example shows the case where importance is added to the "weather satellite image" being image information in the information of "whether reports" and  
25 the "center" is defined as its important point, and importance is added to letter information in the

information of "airline seat availabilities" and the  
"whole" is defined as its important point.

And, FIGS. 18 and 19 show cases where characters  
are presented with "weather reports" and "airline seat  
5 availabilities", respectively, and in FIG. 18, a  
character 1801 is shifted in the right direction so  
that the character does not overlap the "center" that  
is a display position in which the "weather satellite  
image" is displayed. Also, in FIG. 19, a character  
10 1901 is shifted in the upper direction so that the  
character does not overlap the "whole" that is a  
display position in which the "airline seat  
availabilities" is displayed.

In the above described Second Embodiment, the  
15 importance of the letter information and image  
information in distributed information is determined  
based on their position information, but the importance  
of the letter information and image information may be  
determined based on the importance added in advance by  
20 the information distribution computer 2101 and  
information of restrictions on viewing such as  
exclusion of people under eighteen yeas of age.

Also, it is possible to apply information  
processing such as natural language processing and  
25 image recognition to the letter information and image  
information in distributed information, and dynamically



determine the importance of the letter information and image information based on the result of the processing.

Also, it is possible to determine dynamically the positions in which discriminating expressions and  
5 unfavorable images based on the result of the processing, and place characters over information needing to be prevented from being displayed such as letter information including a discriminating expression and unfavorable image information to hide  
10 such information from users' view, for example, based on the result of the determination.

Also, when the character is placed over the information needing to be prevented from being displayed, the character may be enlarged if the region  
15 in which the information is displayed is so large compared to the character that the information cannot be hidden.

In this way, flags for controlling character display positions (importance and the need for hiding  
20 information, and important points and points in which information needs to be hidden) are added to the letter information and image information in distributed information, and the display position is controlled based on the added flags so that the position in which  
25 the character is displayed does not overlap or overlaps the position in which the letter information and image

information are displayed, thereby making it possible to present information more suitably.

Also, if the region in which information needing to be prevented from overlapping the character is  
5 displayed is so large that the information cannot be prevented from overlapping the character, the character may be downsized or erased on a temporary basis.

Also, prior to the presentation of information, the position in which the character is displayed is  
10 controlled so that the letter information and image information are prevented from overlapping the character, but they may be displayed in such a manner that they overlap one another on a temporary basis before the position in which the character is displayed  
15 is controlled.

Also, prior to the presentation of information, the position in which the character is displayed is controlled so that the letter information and image information are prevented from overlapping the  
20 character, but if the user moves the character to cause overlapping during presentation of information, the position in which the character is displayed may be controlled in such a manner as to avoid the overlapping.

As described above, according to Second Embodiment,  
25 the importance of and the need for the hiding of letter information and image information presented together with the character are described, the position in which

the letter information and image information are presented and the position in which the character is presented are calculated, and the position in which the character is presented is controlled so that they are prevented from overlapping one another or they are caused to overlap one another, thereby making it possible to present information more effectively.

<Third Embodiment>

As described in First Embodiment, when the virtual caster reading out in synthetic voice news articles provided by the news articles provider conveys a news article to users in the manner of television programs, the user indicates and inputs by voice a desired news genre, and the inputted voice is voice-recognized, whereby the news article and the character can be changed to those of the desired news genre.

In this case, when one news genre is ended and switching to the next news genre is taking place, or when the user designates by voice a desired news genre, the switching of the news genre can be confirmed only by the fact that the character is switched visually, and it may be difficult to confirm aurally the switching of the news genre particularly for users who are not familiar with such a system.

Then, in Third Embodiment, more effective presentation of information is achieved with respect to such a point.

FIG. 20 shows a functional configuration of the information presentation apparatus of Third Embodiment of the present invention.

In FIG. 20, a voice input unit 2301 performs  
5 various kinds of voice input for indication of a genre of information to be provided, indication of completion of presentation of information and the like by user's voice input. A voice recognition unit 2302 recognizes the user's voice inputted with the voice input unit  
10 2301. A scenario generating unit 2312 creates a scenario by genre from text data and character information. A text data retaining unit 2303 retains text data of each information such as news by genre. A character information retaining unit 2311 retains  
15 character information with the type and name of the character (animation image) brought into correspondence with the genre read out by the character.

Furthermore, various kinds of information of text data retained in the text data retaining unit 2303 may  
20 be information stored in the external storage device 106, information distributed via the network 2103 from other terminals (e.g. information distribution computer 2103) or the external storage device.

A voice synthesis unit 2308 transforms into  
25 synthetic voice a scenario created by the scenario generating unit 2312 or a conversation created by a conversation generating unit 2305. A voice output unit

2307 outputs synthetic voice generated by the voice synthesis unit 2308. A character display unit 2309 displays the character in accordance with the synthetic voice outputted from the voice synthesis unit 2308.

- 5 And, a control unit 2304 deals with timing for input/output of voice and display of the character and so on, and controlling various kinds of components of the information presentation apparatus.

A genre specification unit 2306 specifies a genre  
10 that the selected character belongs to, based on the character information retained in the character information retaining unit 2311. A conversation generating unit 2305 creates data of a conversation held between characters at the time of switching  
15 between genres. A conversation data unit 2310 retains conversation data for each character.

FIG. 21 is a flowchart showing a procedure for processing carried out by the information presentation apparatus of Third Embodiment of the present invention.

- 20 When this information presentation apparatus is started, if not specified by the user, the control unit 2304 determines at random the order of genres of which information is to be provided, and the scenario generating unit 2312 creates a scenario of the  
25 character reading out the information of the selected genre, based on the text data of the selected genre retained in the text data retaining unit 2303, and the

corresponding character information retained in the character information retaining unit 2311 (step S2401).

Then, the character display unit 2309 displays a character on the screen based on the created scenario  
5 by the scenario generating unit 2312 (step S2402).  
After the character is displayed, the text data constituting the scenario is transformed into synthetic voice by the voice synthesis unit 2308, and is outputted by the voice output unit 2307 (step S2403).

10 Then, the control unit 2304 determines whether or not voice input from the user occurs during the outputting of the synthetic voice (step S2404). If the voice input does not occur (NO in step S2404), the process proceeds to step S2413 after the scenario is  
15 read out, and whether or not the scenario read out just previously belongs to the last genre is determined. If it belongs to the last genre (YES in step S2413), the process ends. On the other hand, if it does not belong to the last genre (NO in step S2413), the process  
20 proceeds to step S2407.

On the other hand, if it is determined at step S2404 that voice input occurs (YES in step S2404), the process proceeds to step S2405, where the voice recognition unit 2302 performs voice recognition. Then,  
25 whether or not the result of recognition by the voice recognition is an ending command indicating the end of the presentation of information is determined (step

S2406). If it is an ending command (YES in step S2406), the process ends. On the other hand, if it is not an ending command (NO in step S2406), the process proceeds to step S2407, where the genre specification unit 2306  
5 specifies a genre indicated according to the result of the voice recognition (step S2407).

Then, based on the conversation data of the conversation data unit 2310 corresponding to the character of the specified genre, data of a  
10 conversation held between the character of the just previous genre and the character of the specified genre at the time of switching between genres (step S2408).

Then, the created conversation data is transformed into synthetic voice by the voice synthesis unit 2308,  
15 and the conversation of the just previous character (hereinafter referred to as character A) is outputted by the voice output unit 2307 (step S2409). After the conversation of the character A is outputted, the character display unit 2309 displays the character of  
20 the next genre (hereinafter referred to as character B) (step S2410). Then, after switching to display of the character B is done, the conversation of the character B is outputted by the voice output unit 2307 (step S2411).

25 Then, the character display unit 2309 turns to the scenario of the next genre (step S2412), and the

process returns to step S2403, where presentation of information is continued.

One example of presentation of information including a conversation between the character A and the character B at the time of switching between genres in the above described processing will be described using FIG. 22.

FIG. 22 shows one example of presentation of information including a conversation between the character A and the character B in Third Embodiment of the present invention.

Furthermore, in Third Embodiment, the conversation between the character A and the character B at the time of switching between genres is voice-outputted, but the letter string corresponding to this voice output may be presented on the screen together. FIG. 22 shows an example of such a case.

In FIG. 22, information is displayed on a screen 2501 of an information processing apparatus such as a personal computer operated as the information presentation apparatus. In this example, the character A belongs to a "political" genre and the character B belongs to a "financial" genre, and the example shows the case where switching is done from the "political" genre to the "financial" genre. An animation image 2502 shows the character A. An animation image 2505 shows the character B. Conversations 2503 and 2506 of



the character A and character B, respectively, are made at the time of switching between genres.

When this conversation is created with the conversation generating unit 2305, letters 2504 showing the next genre (here, "political" genre), and letters 2508 showing the name of the character B (Mr. ○○) are fetched from the character information retaining unit 2311 as information of the character B, and are then embedded in a fixed sentence and transformed into synthetic voice to output words 2503 of the character A ("Now, financial news. Go ahead, please, Mr. ○○.").

Also, letters 2507 showing the previous genre (here, "political" genre) are fetched from the character information retaining unit 2311 as information of the character A, and letters 2509 showing the next genre (here, "financial" genre) are fetched from the character information retaining unit 2311 as information of the character B, and are embedded in a fixed sentence and transformed into synthetic voice to output words 2506 of the character B ("Yes. So, following the political news, financial news will now be provided.").

As described above, according to this Third Embodiment, when the character presenting information reads out completely the text in the genre corresponding to the character, or when the user gives instructions to switch between genres by voice, a

conversation for takeover between the character reading  
out the scenario of the previous genre and the  
character reading out the scenario of the next genre is  
inserted in the process of switching between genres,  
5 thereby enabling users unfamiliar with this system to  
aurally recognize switching between genres more easily,  
in particular.

Furthermore, the present invention may be applied  
to a system constituted by a plurality of apparatuses  
10 (e.g. host computer, interface apparatus, reader and  
printer), or may be applied to equipment constituted by  
one apparatus (e.g. copying machine and facsimile  
apparatus).

Needless to say, the object of the present  
15 invention is also achieved by providing to a system or  
an apparatus a storage medium in which program codes of  
software for achieving the features of the aforesaid  
embodiments are recorded, and having the program codes  
stored in the storage medium read and executed by the  
20 computer (CPU or MPU) of the system or the apparatus.

In this case, the program code itself read from  
the storage medium achieves the features of the  
aforesaid embodiments, and the storage medium storing  
therein the program code constitutes the present  
25 invention.

For storage media for supplying program codes, for  
example a floppy disk, a hard disk, an optical memory

disk, a magneto-optical disk, a CD-ROM, a CD-R, a magnetic tape, a nonvolatile memory card and a ROM may be used.

Needless to say, not only the case where the features of the aforesaid embodiments are achieved by executing the program code read by the computer, but also the case where based on instructions of the program code, the OS (operating system) or the like operating on the computer carries out a part or all of actual processing, by which the features of the aforesaid embodiments are achieved is included.

Furthermore, needless to say, the case is also included in which the program code read from the storage medium is written in a memory provided in a feature extension board inserted in the computer and a feature extension unit connected to the computer, and thereafter based on instructions of the program code, the CPU or the like provided in the feature extension board and the feature extension unit carries out a part or all of actual processing, by which the features of the aforesaid embodiments are achieved.

When the present invention is applied to the above described storage media, the program codes corresponding to the flowcharts described previously will be stored in the storage media.

As many apparently widely different embodiments of the present invention can be made without departing

from the spirit and scope thereof, it is to be understood that the invention is not limited to the specific embodiments thereof except as defined in the appended claims.

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THESE ARE THE CLAIMS